APPENDIX 8.5A

Modeling Protocol: Off-site Consequence Analysis for Ammonia

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An off-site consequence analysis (OCA) for ammonia will be conducted for the Edison Mission Energy (EME), Walnut Creek Energy Park (WCEP). EME is required by both the Clean Air Act and the South Coast Air Quality Management District to install Best Available Control Technology to control emissions of criteria air pollutants from the proposed combustion turbines. The turbines will incorporate dry low NO_x combustors that reduce emissions of oxides of nitrogen (NO_x), carbon monoxide (CO), and volatile organic compounds (VOC). In addition, emissions of NO_x from the turbines (and duct burner) will be further reduced through the use of selective catalytic reduction (SCR). The SCR control system utilizes ammonia as the reduction reagent in the presence of a catalyst. Two forms of ammonia may be used in currently designed SCR systems; aqueous ammonia or anhydrous ammonia. Ammonia is a hazardous material and has a specified toxic endpoint (Te) value of 0.14 mg/L, which is approximately equal to 200 ppm (*RMP Offsite Consequence Analysis Guidance, EPA, April 1999*). The Te value is based on a one-hour exposure or averaging time.

Anhydrous ammonia is a gas which is maintained in a liquid state through pressurization of the handling and storage systems. Anhydrous ammonia has a boiling point of approximately 239.72 K. When spilled, anhydrous ammonia will vaporize, releasing ammonia vapors to the surrounding atmosphere.

Aqueous ammonia is a water-based solution and is stored in sealed non-pressurized tanks. Aqueous ammonia is typically sold and transported at molar concentrations ranging from 10 to 30 percent, with higher concentrations typically used at power plants. When spilled, aqueous ammonia will evaporate, releasing ammonia vapors into the atmosphere.

The OCA will be based on the final design configuration of the Walnut Energy Center ammonia storage tanks and secondary containment structure. In addition to the type of ammonia stored on-site, the OCA will consider tank size, surface area of the containment structure, location of the storage area relative to potential off-site receptors, local climatology, and the type of release. Pursuant to the federal Risk Management Plan (RMP) and CalARP regulations, the offsite consequence analysis (OCA) will be performed for the worst case release scenario, which involves the failure and complete discharge of the main storage tank, as well as an alternative release scenario.

Ammonia emissions from two potential release scenarios will be calculated following methods provided in *RMP Offsite Consequence Analysis Guidance, EPA, April 1999*. The default meteorological data necessary for emission and dispersion calculations will be supplemented by daily temperature data as required by CCR Title 19, Section 2750.2. The Walnut Creek Energy Park will be located in the City of Industry, CA. The maximum temperature recorded in the City of Industry in the past 30 years will be used for emission and dispersion calculations.

OCA dispersion modeling will be conducted to predict the potential extent of off-site ammonia concentrations above the specified EPA Te of 200 ppm and the CEC level of significance of 75 ppm. The level considered by CEC staff to be without serious adverse effects on the public for a one-time exposure is 75 ppm (*Preliminary Staff Assessment-Otay Mesa Generating Project, 99-AFC-5, May 2000).* Potential off-site ammonia concentrations will be calculated using the SLAB numerical dispersion model. A complete description of the SLAB model is available in *User's Manual for SLAB: An Atmospheric Dispersion Model for Denser-Than-Air-Releases, D. E. Ermak, Lawrence Livermore National Laboratory, June 1990.* The SLAB user manual contains a substance database which includes chemical-specific data for ammonia. This data will be used in all modeling runs without exception or modification.

Results from the OCA will be tabulated showing the distance from the source release point to the downwind concentrations of 200 ppm and 75 ppm for both release scenarios. The potential area of ammonia concentrations above these values and resulting from the worst case release scenario will be shown in a figure drawn to scale, which shows the ammonia storage location, the proposed Walnut Creek Energy Park and any nearby off-site sensitive receptors.